Linear Relationships at *Tasty Tacos*

Student Worksheet:

You begin working at *Tasty Tacos* with the pay schedule listed in the table below:

Years of Service	Earnings per hour
2	$6.85
4	$7.55
6	$8.25

1.   Describe the pattern found in the table.

2.   Enter the data into the list storage of your calculator.

3.   State an appropriate graphing window, and then graph the data using that window.

4.   What type of relationship exists in the data points? Use mathematics to justify your answer.

5.   Write an equation that describes the relationship between the years (*x*) and the earnings per hour (*y*). Use mathematics to explain how you determined your equation. Use words symbols or both in your equation.

        Equation: _____

6.   Enter your equation into your calculator. Then graph the equations with the data points in the table. Describe the association between the data points and the graph of the line.

7.   What is the slope of the equation and what does it mean in the context of the problem?

8.   What is the *y*-intercept of the equation and what does it mean in the context of the problem?

9.   If this pattern continues, what would the earnings per hour be after working 15 years? Use mathematics to explain how you determined your answer. Use words, symbols or both in your explanation.

10.   If this pattern continues, after how many years of service would you earn $9.65 per hour? Use mathematics to explain how you determined your answer. Use words, symbols, or both in your explanation.

Linear Relationships at *Tasty Tacos*
Answer Key

1. As the years increase by 2 the earnings per hour increase by $.70.

4. The relationship is linear since there is a constant rate of change of .35.

5. Equation: $y = .35x + 6.15$

    Example explanation: $m = \dfrac{7.55 - 6.85}{4 - 2}$ $= .35$

    $y = .35x + b$
    $6.85 = .35(2) + b$
    $6.15 = b$

6. The graph of the line goes through all of the points from the table.

7. The slope of the equation is .35. This represents an increase of $.35 per year.

8. The *y*-intercept of the equation is 6.15. This represents a starting pay of $6.15 per hour.

9. The earnings per hour after 15 years of service would be $11.40.

    $y = .35(15) + 6.15$
    $y = 5.25 + 6.15$
    $y = 11.40$

10. You would earn $9.65 after 10 years of service.

    $9.65 = .35x + 6.15$
    $3.50 = .35x$
    $10 = x$

Linear Relationships at the Carnival

Student Worksheet:

Mark is going to a carnival. He is anxiously looking forward to riding as many rides as possible. In order to enter the park each person is charged a $3 admission fee. The tickets for the rides are $0.75 each.
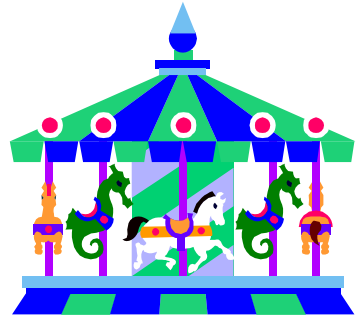
1. Make a table that shows the number of rides (x) and the total cost with admission (y) for Mark's trip to the carnival for 0 to 4 rides.

Rides (x)	Cost (y)
0	
1	
2	
3	
4	

2. Enter the rides and cost data into the list storage of your calculator.

3. Set up an appropriate graphing window, and then graph the data.

4. What type of relationship exists in the data points? Use mathematics to justify your answer.

5. Write an equation that describes the relationship between the number of rides (x) and the total cost (y). Use mathematics to explain how you determined your answer. Use words, symbols, or both in your explanation.

6. Enter the equation into your calculator. Graph the equation with the data points. Describe the association between the data points and the graph of the line.

7. Use the equation in question 3, to determine the cost of 100 tickets.

Cost of 100 tickets: _____

8. If Mark's grandmother gave him $50, how many rides could he ride? Use mathematics to explain how you determined your answer. Use words, symbols, or both in your explanation.

Linear Relationships at the Carnival

Answer Key:

1.

Rides (x)	Cost (y)
0	$ 3.00
1	$ 3.75
2	$ 4.50
3	$ 5.25
4	$ 6.00

4. A linear relationship exists because the points fall along a straight path where a constant rate of change can be found.
5. $Y = 0.75x + 3$

> Example explanation:
> > Slope = (3.75-3.00) / (1-0) = .75 and the y-intercept is 3
> > These values were substituted in the equation   y = mx + b

6. The graph of the line goes straight through the data points because of the linear relationship between them.
7. $78
8. 62 rides

Example explanations:
> > 50 = .75x + 3
> > 47 = .75x
> > 62.67 = x   x = 62 rides
>
> > or
>
> I traced my graph to find x when y = 50.